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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
BAYARD, EMMANUEL	
ART UNIT	PAPER NUMBER
2631	

DATE MAILED: 07/28/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/585,619	NIR ET AL.	
	Examiner	Art Unit	
	Emmanuel Bayard	2631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 June 2000* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-38* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *26-28* is/are allowed.

6)☒ Claim(s) *1-5,7,8,12,15-19,22,24,25 and 29-36* is/are rejected.

7)☐ Claim(s) *6,9-11,13,14,20,21,23,37 and 38* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *2,4* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless -
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371© of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

2. Claims 1-4, 7-8, 12, 15-19, 22, 24-25 are rejected under 35 U.S.C. 102(e) as being anticipated by Casabona et al U.S. Patent No 5,872,540.

As per claims 1, 16 and 25, Casabona et al disclose a method for determining a pseudo ranges and a rate of change thereof to a beacon that transmits a signal including a plurality of blocks, each block including a plurality of frames of a pseudo noise sequence, each block being multiplied by a bit of a data sequence, the signal being shifted relative to a nominal frequency by a

frequency shift, the method comprising the steps of: receiving the signal (see fig.2 element 3 and col.7, lines 28-41); digitizing said received signal (see fig.2 element 13 and col.5, lines 35-36 and col.7, lines 63-66 and col.13, lines 20-25), thereby producing a digitized signal including a plurality of bits; arranging said digitized signal as columns (see figs.2, 3 elements 15, 150 and col.9, lines 55-67 and col.10, lines 1-5, 60-67 and col.11, lines 35-67 and col.13, lines 65-67 and col.19, lines 34-40) of an input matrix that includes a plurality of rows, each said column including consecutive said bits of said digitized signal that correspond to an integral number of frames of the pseudo noise sequence; performing a discrete orthogonal transform on each said row of said input matrix, thereby producing a transformed matrix (see col.10, lines 5-25).

As per claim 2, the method of Casabona does include integral number is one (see col.14, lines 43-44).

As per claim 3, the method of Casabona inherently includes discrete Fourier transform.

As per claim 4, the method of Casabona does include multiplying each said element of said transform matrix by a respective factor (see col.11, lines 31-67 and col.13, lines 65-67).

As per claim 7, the method of Casabona does include convolving each said column of said transformed matrix with the pseudo noise sequence (see col.19, lines 36-39).

As per claim 8, Casabona does include identifying at least one peak of said matrix having a row and column coordinates (see col.12, lines 1-20 and col.19, lines 62-67 and col.20, lines 6-15).

As per claims 12, 22, the method of Casabona does include integrating said transformed matrices to produce a sum matrix (see col.4, line 21 and col.5, line 17 and col.12, lines 45-46 and

col.14, lines 37-40 and col.16, lines 10-11) and include identifying at least one peak of said matrix having a row and column coordinates (see col.12, lines 1-20 and col.19, lines 62-67 and col.20, lines 6-15).

As per claim 15, the method of Casabona does includes multiplying groups (see col.11, lines 31-67 and col.13, lines 65-67).

As per claim 17, the method of Casabona does include arranging said digitized signal as columns (see figs.2, 3 elements 15, 150 and col.9, lines 55-67 and col.10, lines 1-5, 60-67 and col.11, lines 35-67 and col.13, lines 65-67 and col.19, lines 34-40) of a first matrix that includes a plurality of rows, each said column including consecutive said bits of said digitized signal that correspond to an integral number of frames of the pseudo noise sequence; performing a discrete orthogonal transform on each said row of said first matrix, thereby producing a transformed matrix (see col.10, lines 5-25).

As per claim 18, the method of Casabona does include multiplying each said element of said transform matrix by a respective factor (see col.11, lines 31-67 and col.13, lines 65-67) and convolving each said column of said transformed matrix with the pseudo noise sequence (see col.19, lines 36-39).

As per claim 19, the method of Casabona identifying at least one peak of said matrix having a row and column coordinates (see col.12, lines 1-20 and col.19, lines 62-67 and col.20, lines 6-15).

As per claim 24, the method of Casabona inherently includes respective bits of data sequences are common to all the beacons.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Casabona et al U.S. Patent No 5,872,540 in view of Krasner U.S. Patent No 6,289,041 B1.

As per claim 5, Casabona et al teaches all the features of the claimed invention except providing an estimate of frequency shift and said Doppler compensation factor being based on said estimate of the frequency shift.

Krasner teaches a frequency translation (see fig.4 element 404) which is functionally equivalent to the claimed (providing an estimate of frequency shift) and said Doppler compensation factor being based on said estimate of the frequency shift (see col.5, lines 33-67).

It would have been obvious to one of ordinary skill in the art to implement the teaching of Krasner into Casabona as to reduce the amplitude of the matched filter output signal by a quantity equal to sine as taught by Krasner (see col.5, lines 46-47).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Thomson et al U.S. Patent No 6,304,760 B1 in view of Hoshino et al U.S. patent No 6,081,230.

As per claim 29, Thomson et al discloses a method for determining a location of a receiver comprising the steps of: providing a plurality of beacons having respective pseudo noise sequences (see col.4, lines 34-45), all said pseudo noise sequences being of equal length; transmitting (see fig.5 element 25 and col.4, lines 35-35), by each said beacon, a respective signal including a plurality of frames of said respective pseudo noise sequences; receiving (see fig.5 element 30 and col.4, lines 40-45) said transmitted signals collectively as a received signal, by the receiver.

However Thomson et al does not teach inferring, for each beacon, a pseudo range and a rate of change of said pseudo range and inferring the location of the receiver from said pseudo ranges and from said rates of change of said pseudo ranges.

Hoshimo et al teaches inferring, for each beacon, a pseudo range and a rate of change of said pseudo range and inferring the location of the receiver from said pseudo ranges and from said rates of change of said pseudo ranges (see col.1, lines 30-35 and col.2, lines 30-38 and col.12,

lines 28-32 and col.13, lines 13-21 and col.14, lines 2-12 and col.16, lines 13-15, 43-47 and col.24, lines 39-47).

It would have been obvious to one of ordinary skill in the art to implement the teaching of Hoshino into Casabona as to calculate the position of the mobile object by receiving signals sent from four or more GPS satellites as taught by Hoshino (see col.13, lines 20-21).

Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Thomson et al U.S. Patent No 6,304,760 B1 in view of Hoshino et al U.S. patent No 6,081,230 and further in view of Casabona et al U.S. Patent No 5,872,540.

As per claim 30, Thomson and Hoshino in combination teach all the features of the claimed invention except digitizing said received signal, thereby producing a digitized signal including a plurality of bits; for each beacon, arranging said digitized signal as columns of an input matrix that includes a plurality of rows, each said column including consecutive said bits of said digitized signal that correspond to an integral number of frames of the pseudo noise sequence; for each beacon, performing a discrete orthogonal transform on each said row of said input matrix, thereby producing a transformed matrix.

Casabona teaches digitizing said received signal (see fig.2 element 13 and col.5, lines 35-36 and col.7, lines 63-66 and col.13, lines 20-25), thereby producing a digitized signal including a plurality of bits; arranging said digitized signal as columns (see figs.2, 3 elements 15, 150 and col.9, lines 55-67 and col.10, lines 1-5, 60-67 and col.11, lines 35-67 and col.13, lines 65-67 and col.19, lines 34-40) of an input matrix that includes a plurality of rows, each said column

including consecutive said bits of said digitized signal that correspond to an integral number of frames of the pseudo noise sequence; performing a discrete orthogonal transform on each said row of said input matrix, thereby producing a transformed matrix (see col.10, lines 5-25).

It would have been obvious to one of ordinary skill in the art to implement the teaching of Casabona into Thompson and Hoshino as to exploit the differences in apparent polarization of the right hand circular polarization satellite signals and to suppress inband interference and jamming signal in the frequency bands.

7. Claims 31-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura U.S. Patent No 6,041,074 in view of Abbott et al U.S. patent No 6,516,021 B1.

As per claim 31, Nakamura discloses a method for determining a pseudo ranges and a rate of change thereof to a beacon that transmits a signal including a plurality of blocks, each block including a plurality of frames of a pseudo noise sequence, each block being multiplied by a bit of a data sequence, the signal being shifted relative to a nominal frequency by a frequency shift, the method comprising the steps of: receiving the signal (see fig.5 element 501 and col.11, lines 47-48 and col.12, lines 36-40); digitizing said received signal (see fig.6 element 601 and col.13, lines 33-40), thereby producing a digitized signal including a plurality of bits; applying a matched filter algorithm to said digitized signal to extract pseudo noise code change (see figs. 5, 6 element 513 and col.13, lines 33-40), said matched filter algorithm including: demodulating (see figs. 1f, 5 elements 40, 510 and col.12, line 56 and col.13, lines 15-18 said digitized signal relative to the data sequence).

However Nakamura matched filter does not extract the pseudo range and the rate of change of the pseudo range.

Abbott teaches a Kalman filter which is equivalent to the claimed (matched filter) to extract the pseudo range and the rate of change of the pseudo range (see fig.2 element 46 and col.7, lines 48-67 and col.10, lines 44-50).

It would have been obvious to one of ordinary skill in the art to implement the teaching of Abbott into Nakamura as to determine the first and second derivatives time rate of the pseudo range as taught by Abbott (see col.10, lines 48-50).

As per claims 32 and 33, aligning the bits of the data sequence prior to said demodulation would have been include into Nakamura as to generate a code tracking loop functions by driving the code phase of a replica to be aligned with the received signal so as to enable coherent demodulation of the received signal.

Claims 34-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura U.S. Patent No 6,041,074 in view of Abbott et al U.S. patent No 6,516,021 B1 and further in view of Casabona et al U.S. Patent No 5,872,540.

As per claim 34, Nakamura and Abbott teach all the features of the claimed invention except arranging said digitized signal as columns of an input matrix that includes a plurality of rows, each said column including consecutive said bits of said digitized signal that correspond to an integral number of frames of the pseudo noise sequence;

performing a discrete orthogonal transform on each said row of said input matrix, thereby producing a transformed matrix.

Casabona teaches arranging said digitized signal as columns (see figs.2, 3 elements 15, 150 and col.9, lines 55-67 and col.10, lines 1-5, 60-67 and col.11, lines 35-67 and col.13, lines 65-67 and col.19, lines 34-40) of an input matrix that includes a plurality of rows, each said column including consecutive said bits of said digitized signal that correspond to an integral number of frames of the pseudo noise sequence; performing a discrete orthogonal transform on each said row of said input matrix, thereby producing a transformed matrix (see col.10, lines 5-25).

It would have been obvious to one of ordinary skill in the art to implement the teaching of Casabona into Nakamura and Abbott as to exploit the differences in apparent polarization of the right hand circular polarization satellite signals and to suppress inband interference and jamming signal in the frequency bands.

As per claim 35, Nakamura and Abbott teach all the features of the claimed invention except multiplying each said element by a respective factor.

Casabona teaches multiplying each said element by a respective factor (see col.11, lines 31-67 and col.13, lines 65-67).

It would have been obvious to one of ordinary skill in the art to implement the teaching of Casabona into Nakamura and Abbott as to exploit the differences in apparent

polarization of the right hand circular polarization satellite signals and to suppress inband interference and jamming signal in the frequency bands.

As per claim 36, Nakamura and Abbott teach all the features of the claimed invention except convolving each said column of said transformed matrix with the pseudo noise sequence and identifying at least one peak of said matrix having a row and column coordinates.

Casabona teaches convolving each said column with the pseudo noise sequence (see col.19, lines 36-39) and identifying at least one peak of said matrix having a row and column coordinates (see col.12, lines 1-20 and col.19, lines 62-67 and col.20, lines 6-15).

It would have been obvious to one of ordinary skill in the art to implement the teaching of Casabona into Nakamura and Abbott as to exploit the differences in apparent polarization of the right hand circular polarization satellite signals and to suppress inband interference and jamming signal in the frequency bands.

Allowable Subject Matter

8. Claims 6, 9-11, 13-14, 20-21, 23, 37-38 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

9. Claims 26-28 are allowed over the prior art of record.

10. The following is a statement of reasons for the indication of allowable subject matter: the prior arts of record fail to anticipate or render obvious the following recited features: said estimate of the frequency shift being used to determine which said columns of said transformed matrix are produced by said discrete orthogonal transform as recited in claim 6. Said column coordinate of said most likely peak then corresponding to the rate of change of the pseudo range as recited in claims 9, 13, 20-21, 23 and 38. Inferring the pseudo range and the rate of change of the pseudo range from said row coordinates and said column coordinates as recited in claims 10-11, 37. Wherein said multiplying is effected separately for each said estimate of the frequency shift, thereby producing a corresponding plurality of Doppler compensated matrices as recited in claim 14.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Juri et al U.S. Patent No 5,585,853 teaches a bit rate reduction apparatus.

Yassa U.S. Patent No 6,023,294 teaches a bit budget estimation method..

Haardt et al U.S. Patent No 6,353,731 B1 teaches a method and measurement configuration..

De With et al U.S. Patent No 6,385,247 B1 teaches an encoding circuit.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Emmanuel Bayard whose telephone number is (703) 308-9573. The examiner can normally be reached on Monday-Thursday from 8:00 AM - 5:30 PM. The examiner can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chi Pham, can be reached on (703) 305-4378. The fax phone number for this Group is (703) 872-9314.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 305-3800.

Emmanuel Bayard

Primary Examiner

July 16, 2003